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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/572,590

03/20/2006

Takashi Takeuchi

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EXAMINER

BEST, ZACHARY P

ART UNIT

PAPER NUMBER

1795

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/572,590	<b>Applicant(s)</b> TAKEUCHI ET AL.	
	<b>Examiner</b> Zachary Best	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5 and 7-16 is/are pending in the application.
- 4a) Of the above claim(s) 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5 and 7-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                     |                                                                   |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                         | 6) <input type="checkbox"/> Other: _____                          |

**NON-AQUEOUS ELECTROLYTE SECONDARY BATTERY WITH  
LAMINATED SEPARATOR**

Examiner: Z. Best    S.N. 10/527,590    Art Unit: 1795

**DETAILED ACTION**

1. Applicant's amendment filed November 19, 2009 was received. Claim 1 was amended. Claims 1-2, 4-5, and 7-15 are currently pending examination.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Specification***

3. The objection to the specification is withdrawn because the title was amended.

***Claim Rejections - 35 USC § 103***

4. The claim rejections under 35 U.S.C. 103(a) of Claims 1-3, 5, and 7-15 as being unpatentable over Ohzuku et al. in view of Takahashi are withdrawn because independent Claim 1 was amended.
5. Claims 1, 4-5, and 7-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pouillier et al. (Pouillier, C., et al. "Synthesis and Characterization of New LiNi<sub>1-y</sub>Mg<sub>y</sub>O<sub>2</sub> Positive Electrode Materials for Lithium-Ion Batteries." Journal of The

Electrochemical Society, 147(6) (2000): 2061-2069,) in view of Ohzuku et al. (JP 2003-086183 A) and Takahashi (US 5,856,039 A). Further references to Ohzuku et al. will be based on corresponding US 2004/0058243 A1).

Regarding Claims 1 and 4, Pouillier et al. teach a rechargeable lithium battery (pg. 2061, a lithium battery would inherently have a positive electrode, a negative electrode, a separator, and an electrolyte) with a positive electrode active material having the general formula  $\text{LiNi}_{0.98}\text{Mg}_{0.02}\text{O}_2$  (pg. 2064, Table III) created by coprecipitation (abstract). However, Pouillier et al. fail to teach the addition of element L or the separator comprising a plurality of laminated monolayer films.

Ohzuku et al. teach a rechargeable lithium battery wherein a coprecipitated composite oxide is doped with aluminum such that the aluminum concentration is in the vicinity of the surface of the oxide particle (par. 80) such that the aluminum will increase the potential of the positive electrode active material (par. 80). Therefore, it would have been obvious to one having ordinary skill in the art to modify the coprecipitated oxide by doping with aluminum because Ohzuku et al. teach doping the positive electrode active material with aluminum will increase the potential of said active material. Examiner believes the resultant positive electrode material is obvious in range or anticipates the general formula found in Claim 1.

Takahashi teaches a non-aqueous electrolyte secondary battery (abstract) having a plurality of laminated monolayer films (col. 2, lines 13-16), said plurality of monolayer films each have a fine porous structure (col. 2, lines 13-16), having a positive electrode-side

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monolayer film comprising polypropylene (col. 2, lines 12), such that the separator will have a high piercing strength and high shut-down characteristic (col. 1, lines 53-56). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the separator of Takahashi, as described above, in the secondary battery of Pouillier et al. and Ohzuku et al. because Takahashi teaches said separator has a high piercing strength and high shut-down characteristic.

Regarding Claim 5, Takahashi teaches the positive electrode-side monolayer film further comprises polyethylene (col. 2, line 5), wherein there is not less than 60 wt% of polypropylene (col. 2, lines 18-20).

Regarding Claim 7, Ohzuku et al. teach the secondary battery as described above. While Ohzuku et al. does not specifically teach that the radius of said particle with regards to Al distribution, it is Examiner's position that the similar process steps, materials, and material amounts the radius of Al distribution will be inherent. A reference that is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. *In Re Roberston* 49 USPQ2d 1949 (1999).

Regarding Claims 8-9, Takahashi teaches that the monolayers melt down at about 130° C (col. 5, lines 17-18).

Regarding Claim 10, Takahashi teaches the polypropylene is 20% or lower and has a melting temperature of about 130° C (col. 6, lines 38-45).

Regarding Claim 11, Takahashi teaches the melt temperature is about 130° C and a separator thickness of 25 µm (col. 7, lines 35-60).

Regarding Claim 12, Takahashi teaches that the multilayered film is such that the middle layer will maintain the shut-down characteristic while the end layers will maintain the high piercing strength (col. 2, lines 24-39). Takahashi further teach the final thickness of the multilayered separator is 20-35 µm (col. 2, line 59). Therefore, it would have been obvious to one having ordinary skill in the art to adjust the thickness of each layer in the multilayered film in order to balance the piercing strength and the shut-down characteristics in the multilayered film of Takahashi. Discovery of an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272 (CCPA 1980).

Regarding Claims 13 and 15, Pouillier et al., Ohzuku et al., and Takahashi teach the secondary battery as recited above. It is noted that Claim 13 is a product-by-process claim. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed.Cir. 1985). The secondary battery taught by Pouillier et al., Ohzuku et al., and Takahashi is obvious to that of Applicant's, and therefore, Applicant's process is not given patentable weight in this claim.

Regarding Claim 14, Takahashi teaches the importance of the shut-down feature as a means to close the fine pores of the separator (col. 1, lines 14-28), wherein the multilayered separator has one shutdown layer sandwiched between two other separator layers. It would have been obvious to one having ordinary skill in the art at the time the invention was made

to adjust the pore size of the individual layers of the separator in order to ensure that the shutdown layer will fill the pores of the non-shutdown layers. Discovery of an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272 (CCPA 1980).

### ***Response to Arguments***

6. Applicant's arguments filed November 19, 2009 have been fully considered but they are not persuasive.

*Applicant argues:*

- (a) the combination of Pouillierie et al. in view of Ohzuku et al. and Takahashi is improper;*
- (b) Applicant's invention provides unexpected results.*

In response to Applicant's arguments:

(a) Examiner respectfully disagrees that the argument against the combination of Ohzuku et al. and Takahashi, especially with regard to Ohzuku et al., may be properly applied to the combination where Pouillierie et al. is the primary reference. Applicant argues that Ohzuku et al. is improperly used as a primary reference because of the required chemical ratio of its equivalent Me:M ratio. However, this rationale fails to apply to the chemistry of Pouillierie et al. with applied teachings of Ohzuku et al. and Takahashi. In this

combination of references, Examiner believes the resultant positive electrode material is obvious in range or anticipates the general formula.

(b) Applicant further argues that the combination of the chemistry and layered separator produces unexpected results. Examiner is not persuaded. First, the data from Table 3 is not commensurate with scope of the claims. For example, Applicant claims all transition metal elements (with the exception of Ti, Mn, Y, and Zr) for claimed element Me, but only provides data for one. There is no evidence that a composite oxide with Cu as claimed element Me will produce the same effect, for example, or any other transition metal elements. Furthermore, Applicant bears the burden of showing unexpected results between the claimed invention and prior art. In this case, Applicant shows the difference between the four combinations, which does not correlate to the prior art. For example, the separator of Ohzuku et al. is not merely a polyethylene separator of Table 3, C2, but it is polypropylene or a combination of polyethylene and polypropylene or glass fibers (par 112). Table 3 simply does not provide enough evidence to show that there are unexpected results between the claimed subject matter, which is not commensurate in scope with the data points, and the cited prior art.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Best whose telephone number is (571) 270-3963. The examiner can normally be reached on Monday to Thursday, 7:30 - 5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Zachary Best/  
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/  
Supervisory Patent Examiner, Art Unit 1795